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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,980	05/08/2007	Thorsten Brand	295012US0PCT	2813
22850	7590	04/02/2009		
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			EXAMINER JONES JR., ROBERT STOCKTON	
			ART UNIT 4151	PAPER NUMBER
			NOTIFICATION DATE 04/02/2009	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	Application No. 10/589,980	Applicant(s) BRAND ET AL.	
	Examiner ROBERT JONES	Art Unit 4151	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period **will** apply and **will** expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply **will**, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.  
     4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
     a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>11/20/2006</u> . | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

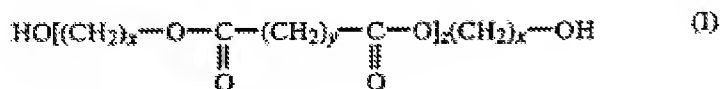
A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1 and 5-30 are rejected under 35 U.S.C. 102(b) as being anticipated by Muller et al. (US Pat. No. 5,019,638).

Regarding Claims 1, 5, 6, 17, 18, and 19, Muller teaches hot melt adhesives obtained from reaction products of polyisocyanates and hydroxypolyesters, where the hydroxypolyesters are preferably purely aliphatic and contain at least 12 methylene groups in the polyester unit of diol and dicarboxylic acid (col. 1, lines 6-12). Muller further teaches a process for producing a hot melt adhesive comprising reacting 1 mol of the various polyesters from Table 1 (col. 3-4; also seen below) with 2.2 mols of 4,4'-methylenediphenyl diisocyanate (MDI) (col. 4, lines 23-33).

Polyesters suitable for use in the invention are characterized by the formula below



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In formula (I) above,  $x + y = 12$  to 26 or alternatively  $y = 12$  to 18 or  $x = 6$  to 18 and  $z = 3$  to 50 (col. 2, lines 5-15). When  $y=14$ , the dicarboxylic acid reads on hexadecanedioic acid; when  $y=16$ , the dicarboxylic acid reads on octadecanedioic acid.

Regarding Claims 7-16 and 20-29, Muller teaches hot melt adhesives based on polyesters of the formula (I), in which the aliphatic dicarboxylic acids are replaced up to 80 and preferably up to 50 mol percent by aromatic dicarboxylic acids. The melting point of these mixed polyesters containing aromatic dicarboxylic acids is below 95°C, preferably below 90°C (col. 3, lines 3-10). Several examples of polyesters used to prepare the hot melt adhesive which meet the requirements of Claims 7-16 are included in Table I (col. 3-4) below:

TABLE 1

Example No.	Composition of the basic polyester and its properties after reaction with MDI in a ratio of OH:NCO of 1:2.2									Setting		
	Composition									Time sec.	FP (°C.)	V <sub>130</sub> Pa × sec.
	TPS	AD	DS	DDS	MEG	BD	HD	ND	(CH <sub>2</sub> ) <sub>n</sub> n =			
Comparison Example 1		100				100			8	20	62	17
Comparison Example 2		100					100		10	15	65	9
Example 1		100						100	13	10	68	20
Example 2			100				100		14	3	68	9
Example 3				100			100		16	1	74	11
Example 4				100	100				12	2	88	7
Example 5		50		50			100		13	10	58	13
Comparison Example 3	60	40					100		7.6	40	96	50
Example 6	40			60			100		12	20	88	42

TPS = terephthalic acid

AD = adipic acid

DS = decane dicarboxylic acid

DDS = dodecane dicarboxylic acid

MEG = monoethylene glycol

BD = 1,4-butanediol

HD = 1,6-hexanediol

ND = 1,9-nonanediol

n = number of the methylene groups per polyester unit of Formula (I)

FP = flow point (ring and ball) of DIN 52 011

V<sub>130</sub> = melt viscosity at 130° C. (Brookfield)

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Example 6 in the table above comprises a diacid having 12 intervening methylene groups (tetradecanedioic acid), and replaces a portion of the aliphatic diacid with terephthalic acid, an 8-carbon aromatic diacid which meets the limitation of "dicarboxylic acids having shorter carbon chains" in Claims 10-12 and 23-25, and the limitation "aromatic dicarboxylic acids" in Claims 13-16 and 26-29.

Further regarding Claims 10-12 and 23-25, Examples 3-5 and 6 in the table above replace a portion of the diacid with dodecane dicarboxylic acid.

Further regarding Claims 5, 6, 18, and 19, Example 2 in the table above comprises a diacid having 14 intervening methylene units (hexadecanedioic acid), while Example 3 comprises a diacid having 16 intervening methylene units (octadecanedioic acid).

Regarding Claim 30, Muller teaches a process in which the hot melt adhesive is applied thinly from the melt at 120°C on a square piece of wood and immediately joined to a second square piece of wood of the same base area (col. 4, lines 3-7).

3. Claims 1, 5, 17, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Markevka et al. (US Pat. No. 4,808,255).

Regarding Claims 1 and 5, Markevka teaches a reactive hot melt adhesive composition which comprises a urethane prepolymer composition which is a reaction product between a polyester polyol and isocyanate composition (col. 2, lines 60-63). The polyester of the invention can be produced by reacting a polyol with a

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polyfunctional carboxylic acid compound (col. 4, lines 28-29) such as 1,18-octadecane dioic acid (col. 4, line 34).

Regarding Claims 17 and 18, Markevka teaches a method for producing said adhesive which comprises reacting the isocyanate compound with the polyester polyol compound at elevated reaction temperatures, typically in the range of 100-400°F. Commonly the polyisocyanate is introduced into a suitable reaction vessel, heated to reaction temperature, and into the heated isocyanate compound is placed the polyester polyol for reaction (col. 7, lines 24-31).

4. Claims 1, 5, 17, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Takada et al. (US Pat. No. 4,985,535).

Regarding Claims 1 and 5, Takada teaches a moisture-curable hot melt adhesive composition comprising a reaction product obtainable by reacting a high molecular weight thermoplastic polyester and a polyisocyanate compound (Abstract). The carboxylic acid which can be used in the formation of said polyester (col. 2, lines 20-22) include, inter alia, dodecanedioic acid (col. 2, line 26), icosanedioic acid (col. 2, line 26), and octadecanedicarboxylic acid (col. 2, lines 28-29).

Regarding Claims 17 and 18, Takada teaches a process for producing said adhesive which comprises reacting a mixture of said thermoplastic polyester and a low molecular weight polyol with a polyisocyanate (col. 5, lines 4-10).

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5. Claims 1, 5, 17, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Miskovic et al. (PCT No. FR98/02763; US Pat. No. 7,022,804 incorporated herein as English translation).

Regarding Claims 1 and 5, Miskovic teaches a moisture-crosslinkable hot-melt adhesive which is composed of a polyurethane prepolymer obtained by polyaddition of at least one polyol to at least one isocyanate (Abstract). The polyol is generally chosen from polyether polyols, polyester polyols, and unsaturated polyols (col. 2, lines 17-18). The polyester polyols may result from the condensation of aliphatic, cyclic, or aromatic polyols (col. 2, lines 41-43) with an acid (col. 2, line 47) such as, inter alia, 1, 18-octanedioic acid (col. 2, lines 49-50).

Regarding Claims 17 and 18, Miskovic teaches a process for the preparation of said adhesive which comprises reacting the polyols with the isocyanates with the exclusion of moisture and, if appropriate, under a protective gas, at a temperature from 90 to 120°C, until the desired content of isocyanate group is obtained (col. 3, lines 40-49).

### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

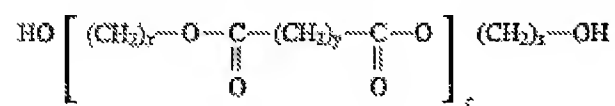
7. Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Werenicz et al. (US Pat. No. 5,508,371) in view of Muller as applied to Claims 1 and 5-30 above.

Regarding Claims 1-5, Werenicz teaches a polyurethane fusion adhesive hardened by the action of moisture which contains at least one reaction product from a component that contains NCO groups (isocyanate) and an essentially linear hydroxypolyester, hydroxypolyether, and/or hydroxypolyetherester component



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(Abstract, lines 1-6). Although Werenicz's composition is described as a fusion adhesive rather than a hot melt adhesive, one of ordinary skill in the art will recognize its ability to function in either capacity. Said adhesive consists wither wholly or in part of conversion products of components that contain NCO groups, namely, polyfunctional isocyanates, and partially crystalline hydroxypolyesters with contents of exclusively aliphatic dicarboxylic acids, of the general formula seen below:



wherein  $x + y = 12$  to  $26$  and, optionally  $y = 8$  to  $12$  or  $x = 6$  to  $18$  and  $z = 3$  to  $50$ .

Werenicz does not teach that said polyester comprises at least one linear aliphatic dicarboxylic acid having from 13 to 22 methylene groups (col. 2, lines 43-55).

The ratio of the reaction of OH:NCO is preferably 1:1.5 to 1:2.5 (col. 2, lines 55-56). Muller states that it is advantageous to use a number of diisocyanates in said adhesive (col. 5, lines 48-51). When a diisocyanate is reacted with a dihydroxypolyester of the formula above in the preferred ratio, said adhesive will comprise between 28.5 and 40% of said polyester.

Muller teaches a hot melt adhesive containing a polyester described by formula (I), included above with regard to Claims 1 and 5-30. Muller further teaches that the use of said polyesters, comprising a dicarboxylic acid with 12 to 18 methylene groups, leads to a 5- to 20-fold increase in setting rate of the adhesive.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Werenicz's adhesive to contain Muller's polyester such that the ratio

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of Muller's polyester to isocyanate is 1:1.5 to 1:2.5, or between 28.5 and 40% polyester, for the benefit of an increased setting rate.

### ***Conclusion***

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT JONES whose telephone number is (571)270-7733. The examiner can normally be reached on Mon-Thurs, 7:30 AM - 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Angela Ortiz can be reached on (571)272-1206. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Katarzyna Wyrozebski/  
Primary Examiner, Art Unit 1796

R.J.

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